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A NEW PANAMA *ECITON* (HYMENOPTERA, FORMICIDAE)

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The ants of the genus *Eciton* are the conspicuous terrestrial army ants of the American tropics. Those species having soldiers with large, fishhook-shaped mandibles are few in number, and constitute the subgenus *Eciton*. *Eciton hamatum* and *burchelli* occur over a large area of the American tropics and have been the chief subjects of the well-known studies by T. C. Schneirla, particularly from the point of view of their fascinating behavior and the underlying biological processes concerning brood production which condition it very intimately.

Schneirla, in the course of studies on Panama ecitons in late 1947, took a species of the subgenus *Eciton* which is described below. The species of this subgenus are so highly polymorphic that considerable caution is advisable in describing new forms until the range of variability has been worked out. The data obtained by Schneirla, however, warrant a name for his species, so clearly distinct morphologically from *hamatum* and *burchelli*.

The taxonomic history of the species of *Eciton* is a story of unusual confusion. The early collectors in the American tropics occasionally took the winged males at lights, along with other insects, and these were described as wasps. In the meanwhile the large soldier caste with mandibles like fishhooks had been described under various generic names. The realization that the males were really ants came much later. Still later came the correlating of males with soldiers or workers, a process which is likely to go on for some time, since many species are still known by only the male or only the soldier and worker castes.

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The males of *Eciton* show distinctive species characters, and the temptation has been great to describe an unusual specimen as a new species differing from known males. Menozzi (1926) has been one of the latest describers on this basis, and his *E. (E.) velutatum* from Costa Rica has yet to be correlated with the other castes.

There is no evidence linking *velutatum* with the present described species so that those known in the soldier caste may be considered. Of these species, two have a tooth on the median border of the mandibles as does the Panama species, and it appears to be intermediate between them. They are *lucanoides* Emery, described from Peru, and *quadriglume* (Haliday), described from Brazil. The *lucanoides* soldier has the median mandibular tooth much longer and narrower, becoming almost recurved, while the *quadriglume* soldier has more slender mandibles with the median tooth much less developed.

Eciton lucanoides was figured originally by Emery as having a straight, rather than impressed, occipital margin and with the above mandibular characters. Mann (1916) recorded it from Brazil, and Borgmeier (1936) from Nicaragua and Costa Rica. Mann states that he was "unable to distinguish the minors and mediae of *E. lucanoides* from those of *E. hamatum* by any single character." The present Panama species, the sculpture and color of which in the worker caste are those of *hamatum*,¹ shows distinct differences in the pedicel and therefore is not likely to be conspecific with Mann's Brazilian specimens. The question then arises as to the correctness of identification of the Nicaraguan and Costa Rican specimens. They may be conspecific with the Panamanian form, and future study may serve to demonstrate the limits of variability of *lucanoides*.

Eciton quadriglume is summarized as follows by Santschi: "Cette belle espèce est facile à distinguer par sa couleur noir et mate chez les ♂ et dont la tête et le dessus du thorax vire au rouge sombre chez les ♀. Les épines épinotales sont bien plus longues que leur intervalle." Bruch's excellent photographs also indicate a darker form than the Panamanian species and one with mandibles with a greatly reduced median tooth, appearing in the photograph as being merely a slight convexity at this site.

¹ Schneirla reports that in life the workers of this species were all distinctly darker in coloration than those of the two colonies of *hamatum* observed in the same (type) locality.

Distinct differences in proportions of the pedicel also appear. The species occurs in a number of the Brazilian states, including the southernmost, and in Misiones, Argentina.

The Panamanian form is therefore described as a new species, as follows:

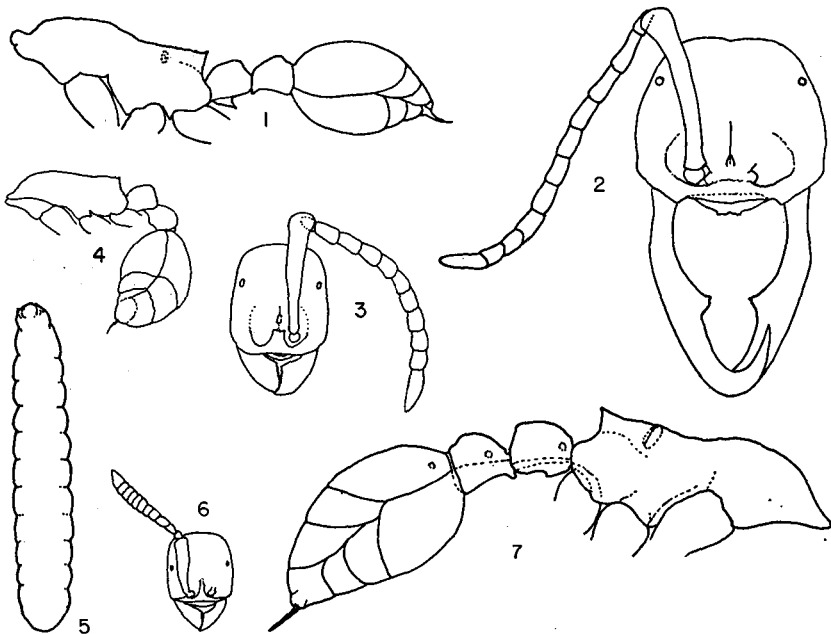
Eciton (*Eciton*) conquistador, new species

SOLDIER: Total length extended, including head, 11.7–13.5 mm.; of head, including mandibles, 5 mm.; of thorax, 3.5 mm. Head in front view, excluding mandibles, 2.2–2.5 mm. long by 2.5–2.7 mm. wide, being distinctly wider than long, occipital margin impressed, sides convex and broader anteriorly than posteriorly, anterior clypeal margin feebly convex; lateral clypeal margins produced as a triangular, convex lobe directed towards the antennal insertions; eyes convex, 0.15–0.18 mm. in diameter; mandibles long and slender, the apical tooth acute and recurved, near the middle of the median border a second tooth arises from an obtusely angulate, broad base, distal to this may or may not arise a slight, broad convexity; antennal scapes exceeding occipital corners, slightly bowed and enlarged distally. Thorax from above convex through the pronotum at the sides, impressed in the pro-mesonotal region and with sides of epinotum straight, converging slightly posteriorly; in side view sinuate dorsally, the pronotum and basal surface of the epinotum slightly convex; basal epinotal surface with a lamina on each side fusing distally, where produced as a pair of triangular teeth, the fused lamellae continue down the declivous surface as a short median lamella. Petiole from above rectangular, sides slightly convex, broader behind than in front. Post-petiole from above about one-third broader than the petiole, sides convex and strongly converging anteriorly. Gaster small and ovate; legs long and slender.

Dull, being finely and densely punctate over the entire body and appendages; mandibles in addition carrying short and irregular rugae.

Head brownish yellow with anterior margin infuscated, antennae brown with funiculi darker than the scapes, mandibles dark brown; remainder of body brown with a ferruginous tinge.

WORKER: Length, 3–7 mm. Dull, being finely and densely punctate as in the soldier, the mandibles having in addition slight



SPECIMENS FROM TYPE COLONY OF *Eciton conquistador*

FIG. 1. Lateral outline of 7-mm. worker thorax and abdomen with thorax length of 2.5 mm.

FIG. 2. Frontal view of head of soldier.

FIG. 3. Frontal view of head of 7-mm. worker of figure 1.

FIG. 4. Lateral outline of 4.5-mm. worker thorax and abdomen with thorax length of 1.6 mm.

FIG. 5. Outline of 4.5-mm. larva from below. The uniformly simple hairs are not indicated.

FIG. 6. Frontal view of head of 4.5-mm. worker.

FIG. 7. Lateral outline of soldier thorax and abdomen.

and short rugae. Ferruginous, the body and legs being concolorous except for infuscated anterior margin of head and dark brown mandibles and antennae.

TYPE LOCALITY: Area above confluence of Boqueron and Pequeni rivers, tributaries of the Chagres, Republic of Panama, December 15, 1947, T. C. Schneirla. Cotypes in the American Museum of Natural History and in my collection.

It is interesting to note that the two recorded colonies of this eciton were found in the general area of the Camino Real or Las Cruces trail over which, during the Spanish colonial period, pack trains carried gold from Panama City and from the mine

at Candelaria to the Caribbean termination of the route at Porto Bello, for transshipment to Spain. In view of this background, it has seemed very appropriate to accept Schneirla's suggestion that the species be named "*conquistador*."

BEHAVIOR AND BIOLOGICAL CONDITION OF THE COLONIES

(From notes furnished by T. C. Schneirla)

During a five-day survey of the forested Candelaria area above the confluence of the Pequeni and Boqueron rivers, two colonies of this species were found at well-separated points. Within the same period three colonies of *E. hamatum* and just one of *E. burchelli* were found, a fact which suggests that the newly described species is not uncommon in this region in comparison with these other species of *Eciton* (*Eciton*). Thorough searching at Barro Colorado Island, Canal Zone, on the other hand, and surveys in the El Real district of Darien, and also in El Valle, to the east and west of the Canal Zone in Panama, have not disclosed any examples of the species.

COLONY I: Found on November 15, 1947, about 1300 meters west of the Pequeni River, bivouacked within a hollow hardwood tree. The cluster was formed behind a thick partition within the basal hollow of the tree, somewhere within 1 meter from the ground. At 11:30 A.M. a single tree-like system of raiding columns was found, connecting with the bivouac by a single basal column. The presence of scattered debris below the hole through which the ants entered the tree, mainly the empty pupa cases of various ant species (i.e., the remnants of booty objects), indicated a stay of some duration at the site. On November 16 the raiding seemed heavier than before, both along the route of the preceding day and on a new raiding system. The increased magnitude of raiding was indicated by the fact that even after 9:30 P.M. that night a steady column of ants containing many booty carriers was seen returning towards the bivouac. On the following day a considerably heavier two-system raid was established. At 4:00 P.M. a fairly thick column of ants was seen leaving the bivouac tree on one of the principal raiding trails of the day, ordinarily (in *E. hamatum* and other species) a sign of the early stages of a colony emigration. At that time, callow workers were seen in the column and huddled beside the route close to the bivouac. An effort was made to enter the bivouac, without success. It is quite possible that the use of ether in this operation blocked a

movement of the colony which might otherwise have occurred on this last night of observation.

It seemed probable that Colony I had been bivouacked in the same site for some time, evidently passing through a statary (i.e., sessile) phase. There were indications of an impending nomadism, not only in the acceleration of raiding and in the occurrence of a persistent afternoon exodus of the last day, but also in the appearance of newly emerged callow workers at the time.

COLONY II: This colony was found at 11:00 A.M. on November 15, at a point about 3 miles to the west of the site of Colony I, and not far from the Boqueron River. When discovered, the colony was raiding vigorously on three tree-like systems of trails, each with a single base route to the bivouac, and large quantities of insect larvae and pupae were coming in. The bivouac was a plug-formed cluster within the interior of a hollow log hulk and near the broken end, where a considerable part of the mass was exposed. Within the cluster a large number of worker larvae was found, estimated to approach the brood magnitude common in *E. hamatum* and *rogeri*. These larvae seemed essentially mature, and numbers of them were being carried to and from places on the log as well as galleries and cavities in its wall where cocoon spinning was in progress. The bivouac cluster was ransacked rather thoroughly without any discovery of the queen, who may well have escaped with streams of larva-carrying workers into the inaccessible upper interior of the log. On the following day this colony was bivouacked at a point about 140 meters from the previous site, within a hollow tree from which the ants issued at a point about 3 meters from the ground. In mid-afternoon there was just one raiding system, with a single long, unbranched, base column extending to the bivouac tree.

This species may be termed a column raider, by virtue of the fact that its forays involve a tree-like system of raiding trails built up from early morning, much as in *E. hamatum*. Once a raid has developed, each trail system connects with the bivouac by a single base column as in *hamatum* and *rogeri*, and the peripheral branch trails end in small groups of foraging workers. The columns are characteristically narrower than those of *hamatum* and both in width and in the behavior of workers on them are roughly transitional between *hamatum* and *rogeri*. As in both of these species, the booty of the newly described species

is almost exclusively composed of the soft-bodied young (larvae and pupae) of other insects, and particularly of ants and wasps.

The circumstances suggested that Colony I was terminating a statary phase with the emergence of a brood of mature workers, and that Colony II passed from its last day of a nomadic phase to its first day of a statary phase (with the effective enclosure of a brood of mature worker larvae) while under observation. In other words, both in its daily forays and in its evident conformity to a rhythmic nomad-statary pattern of life, the condition of this species resembles that previously described for *E. hamatum* (Schneirla, 1938, 1944).

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